UNITED STATES PATENT AND TRADEMARK OFFICE

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _01/17/06_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _15-28_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _15-28_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _01/17/06_ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   This communication is in response to the Application No. 10/564,866 filed

on 01/17/06. Claims 15 - 28 has been examined, claims 1 – 14 has been

cancelled before examination.

Drawings

2.   Drawing 5 is objected to because they do not provide name to the blocks.

The person in ordinary skilled in the art should be able to understand those

rectangular and square blocks without referring to specification. Corrected

drawing sheets in compliance with 37 CFR 1.121 (d) are required in reply to the

Office action to avoid abandonment of the application. Any amended

replacement drawing sheet should include all of the figures appearing on the

immediate prior version of the sheet, even if only one figure is being amended.

The figure or figure number of an amended drawing should not be labeled as

"amended." If a drawing figure is to be canceled, the appropriate figure must be

removed from the replacement sheet, and where necessary, the remaining

figures must be renumbered and appropriate changes made to the brief

description of the several views of the drawings for consistency. Additional

replacement sheets may be necessary to show the renumbering of the remaining

figures. Each drawing sheet submitted after the filing date of an application must

be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the

next Office action. The objection to the drawings will not be held in abeyance.

Abstract

3.   The abstract is objected because of using word "Said". Appropriate

correction required.

The form and legal phraseology often used in patent claims, such as

"means" and "said", should be avoided in the abstract. The abstract should be

sufficiently describe the disclosure to assist readers in deciding whether there is

need for consulting the full patent text or detail, MPEP 608.01 (b).

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in
> public use or on sale in this country, more than one year prior to the date of application for patent in
> the United States.

5.   Claims 15 – 19, 21 – 25, 27 - 28 are rejected under 35 U.S.C. 102(b) as

being anticipated by Eilts et al. (US 20030108127).

Regarding claim 15, Process for estimating a propagation channel formed by

successive symbols of a multi-carrier signal each comprising at least one

reference pilot and a plurality of frequencies carrying data **(i.e. OFDM, The**

OFDM technique sends many carriers in parallel on adjacent frequencies

within a frequency band. The frequencies are variously called frequency

"bins", tones, or subbands. Tones is the term used in the following

description, page 1, paragraph 2), the process comprising:

extracting the said at least one reference pilot present in each of the said

symbols (**i.e. Fig. 3 block 41 extracting the training (also called pilot) tones**

H.sub.TT(k) from the set of all tones H, it is doing it for all k, so it is doing it

for each of symbol in the signal, page 3, paragraph 41);

obtaining a first estimate of the said propagation channel, by analysis of

the said extracted reference pilot (**i.e. Fig. 3 block 44, an inverse fast Fourier**

transform (IFFT) on the training tones is performed to obtain the channel

impulse response or channel estimate, page 3, paragraph 41);

independent correcting the said reference pilot, in phase and amplitude,

and as a function of the said first estimate, to output pilots with phase and

amplitude correction (**i.e. block 47 of Fig. 3, it estimates and corrects phase**

and amplitude, described page 3, paragraph 42 and 43, also the edge tone,

which is transmitted at reduced amplitude, is re-scaled to proper amplitude

at step 43, so it is correcting amplitude, it is done in separate (or

independently) block as shown in fig. 3) obtaining a second estimate of the

said propagation channel, by analysis of the said corrected output pilot (**i.e.**

block 49 of Fig. 3, h'.sub.avg is the phase corrected average. The average

impulse response is then zero padded (block 48) using h'.sub.avg and an

N-point FFT is performed at block 49 to produce the final channel estimate,

page 3, paragraph 44).

Regarding claim 16, Process for estimating a propagation channel according

to claim 15, wherein the said correction step includes a step to calculate an

amplitude and phase error vector for each of the said reference pilots (i.e. **i.e.**

block 47 of Fig. 3, it estimates and corrects phase and amplitude, as

described it first estimates or finds error as described in page 3, paragraph

42 and 43)).

Regarding claim 17, Process for estimating a propagation channel according

to claim 16, wherein the said error vector calculation step includes averaging of a

set of error vectors obtained on at least one symbol (**i.e. block 47 of Fig. 3 all of**

the current impulse response samples h(n) have been phase shifted due to

the phase noise, but the average impulse response h.sub.avg (n) has near

zero phase shift. To estimate the difference in phase between the current

impulse response and the average impulse response, so it averages the

error vectors, page 3, paragraph 42).

Regarding claim 18, Process for estimating a propagation channel according

to claim 17, wherein the said averaging is calculated on each symbol (**i.e. as**

shown in block 47, it averages from 0, 1 .... N_{TT}-1, so it does it for every

symbol, page 3, paragraph 43).

Regarding claim 19, Process for estimating a propagation channel according to

claim 17, wherein the said set of error vectors only includes error vectors that

satisfy at least one predetermined quality criterion (**i.e. applicant does not**

specifically disclose what the quality criterion is, examiner interprets it

broadly as received signal angle, block 47 estimates error and corrects it,

for that it uses angle of received signal, so examiner considers received

angle is a quality criterion, Fig. 3, block 47, page 3, paragraph 42).

Regarding claim 21, Process for estimating a propagation channel according

to claim 15, wherein the said second estimate includes an equalization step that

depends on the first estimate (**i.e. Fig. 3 block 43 which is transmitted at**

reduced amplitude, is re-scaled to proper amplitude at step 43, which is

depend on the first estimate, page 3, paragraph 41).

Regarding claim 22, Process for estimating a propagation channel according

to claim 21, wherein the said equalization step is performed on all carrier

frequencies of each of the said symbols (**i.e. it is done for 0, 1 .... N_{TT}-1, so it does it for every symbol, so it does it for every symbol, page 3, paragraph 43**).

Regarding claim 23, Process for estimating a propagation channel according to claim 21, wherein the process comprises a step after the said equalisation step to calculate a pulse response ((**i.e. impulse response, block 47 of Fig. 3 all of the current impulse response samples h(n) have been phase shifted due to the phase noise, but the average impulse response h.sub.avg (n) has near zero phase shift. To estimate the difference in phase between the current impulse response and the average impulse response, so it averages the error vectors, page 3, paragraph 42**) of the propagation channel as a function of the at least one reference pilot equalized by the equalization step, for refining synchronisation of receivers in time (**Fig. 3 block 43 which is transmitted at reduced amplitude, is re-scaled to proper amplitude at step 43, which is depend on the first estimate, page 3, paragraph 41**).

Regarding claim 24, Process for estimating a propagation channel according to claim 15, wherein the said the reference pilot correction step includes a division of these pilots by the first estimate (**i.e. block 47 of Fig. 3 all of the current**

impulse response samples h(n) have been phase shifted due to the phase

noise, but the average impulse response h.sub.avg (n) has near zero phase

shift. To estimate the difference in phase between the current impulse

response and the average impulse response, so it averages the error

vectors and since average is adding all and divide by the total number so it

does divide them with first estimate, page 3, paragraph 42).

Regarding claim 25, Process for estimating a propagation channel according to

claim 17, wherein the said correction step of the at least one reference pilote also

includes a final step to correct all equalised useful carriers taking account of an

average value obtained as a result of the said averaging (**i.e. block 49 of Fig. 3,**

the average impulse response is then zero padded (block 48) using

h'.sub.avg and an N-point FFT is performed at block 49 to produce the final

channel estimate, which does take averaging value of block 46 and 48,

page 3, paragraph 44).

Regarding claim 27, there are substantially same limitations as claim 15, thus the

same rejection is applicable.

Regarding claim 28, there are substantially same limitations as claim 15, thus the

same rejection is applicable.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

7.   Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Eltis et al. (US 20030108127) in further view of Balaban et al. (US 6369857).

Regarding claim 20, Eltis discloses process for estimating a propagation channel

according claim 16, however does not specifically disclose preliminary step in

which the said pilots with an amplitude less than a first predetermined minimum

average threshold and/or greater than a second predetermined maximum

average threshold are rejected.

Balaban discloses preliminary step in which the said pilots with an

amplitude less than a first predetermined minimum average threshold and/or

greater than a second predetermined maximum average threshold are rejected

(i.e. If the comparison 254 of the amplitude of the signal-to-noise ratio

representation exceeds a predetermined threshold, then the presence of

the digital format pilot signal is detected 256 to confirm that the received

signal is indeed a valid signal in the digital format. However, if the

aforementioned amplitude is less than the predetermined threshold value

or if the pilot signal is not detected, control processor 164 awaits the

presence of a normalized digital signal-to-noise representation that

exceeds the predetermined threshold, col 8, line 43 - 52).

It would have been obvious to one of the ordinary skilled in the art at the

time the invention was made to combine the teachings of Eltis with Balaban. One

would be motivated to combine these teachings because in doing so it will

provide the presence of absence of a valid signal needed in the system (col 8,

line 30 -33).

8.   Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Eltis et al. (US 20030108127) in further view of Fujji et al. (EP 1542384).

Regarding claim 26, Eltis teaches Process for estimating a propagation channel

according to claim 15, However does not specifically disclose further comprising

using the process for correction of at least one phase and/or amplitude error

common to two cells in a same OFDM Orthogonal Frequency Division Multiplex)

type symbol.

Fujji teaches using the process for correction of at least one phase and/or

amplitude error common to two cells in a same OFDM Orthogonal Frequency

Division Multiplex) type symbol (**Consequently, in an environment in which**

identical channel interference is also received from other cells, as in

OFDM-CDMA, the known signal also is influenced by identical channel

interference and a problem which arises is a decline in phase -error

detection precision ascribable to carrier frequency offset, page 7, col 1 - 7).

It would have been obvious to one of the ordinary skilled in the art at the

time the invention was made to combine the teachings of Eltis with Fujji. One

would be motivated to combine these teachings because in doing so it will

provide estimation error in each cell and can correct the error in each cell.

Conclusion

Any inquiry concerning this communication or earlier communications from

the examiner should be directed to TANMAY K. SHAH whose telephone number

is (571)270-3624. The examiner can normally be reached on Mon-Thu (7:30 -

5:00).

If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, David Payne can be reached on 571-272-3024. The fax

phone number for the organization where this application or proceeding is

assigned is 571-273-8300.

Information regarding the status of an application may be obtained from

the Patent Application Information Retrieval (PAIR) system. Status information

for published applications may be obtained from either Private PAIR or Public

PAIR. Status information for unpublished applications is available through

Private PAIR only. For more information about the PAIR system, see http://pair-

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free). If you would like assistance from a USPTO Customer Service

Representative or access to the automated information system, call 800-786-

9199 (IN USA OR CANADA) or 571-272-1000.

/TANMAY K SHAH/
Examiner, Art Unit 2611

/Mohammad H Ghayour/
Supervisory Patent Examiner, Art Unit 2611